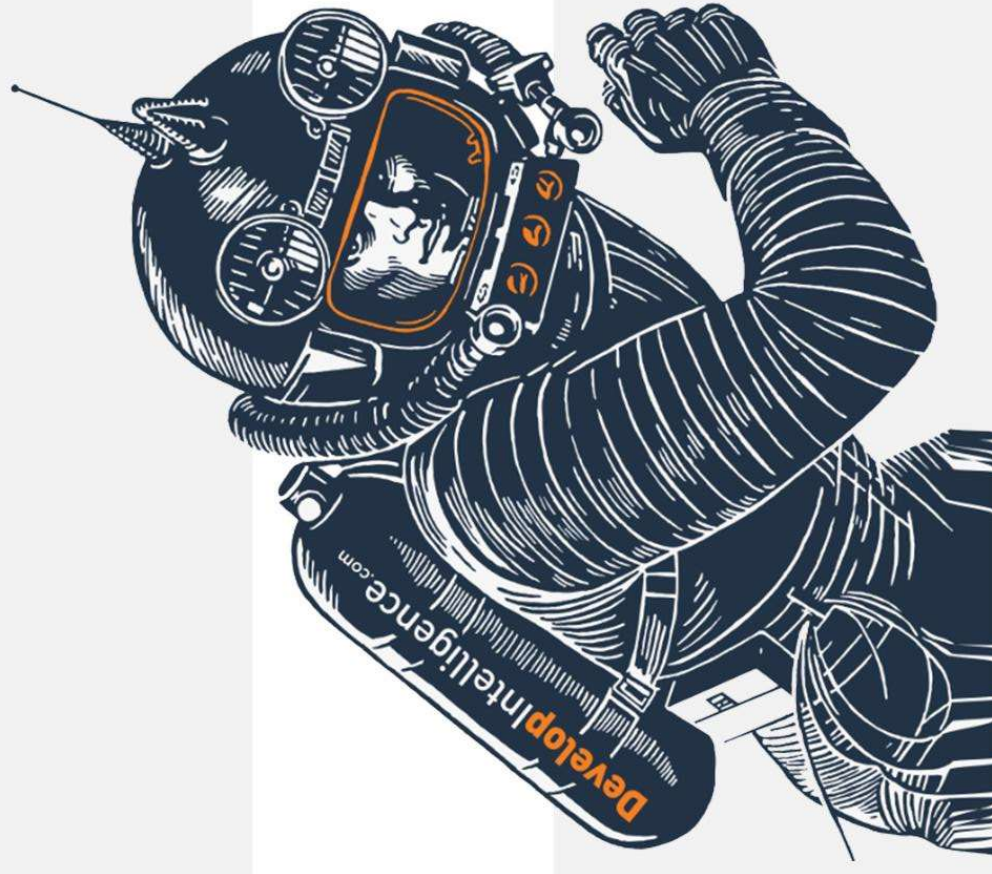


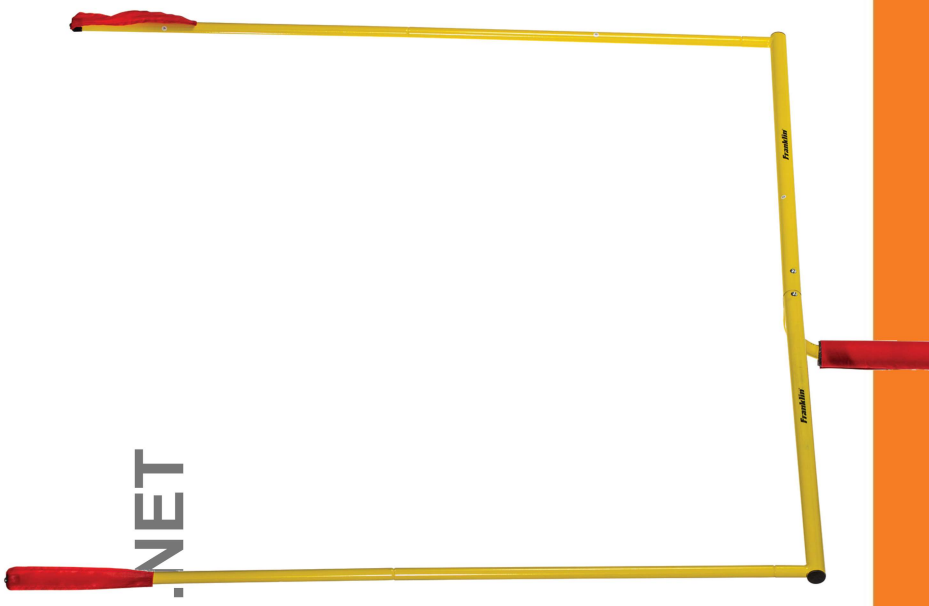
Core Basics





Goals

- Name an advantage of .NET (Core)
- Distinguish between **.NET**, **.NET Core**, and **.NET Framework**

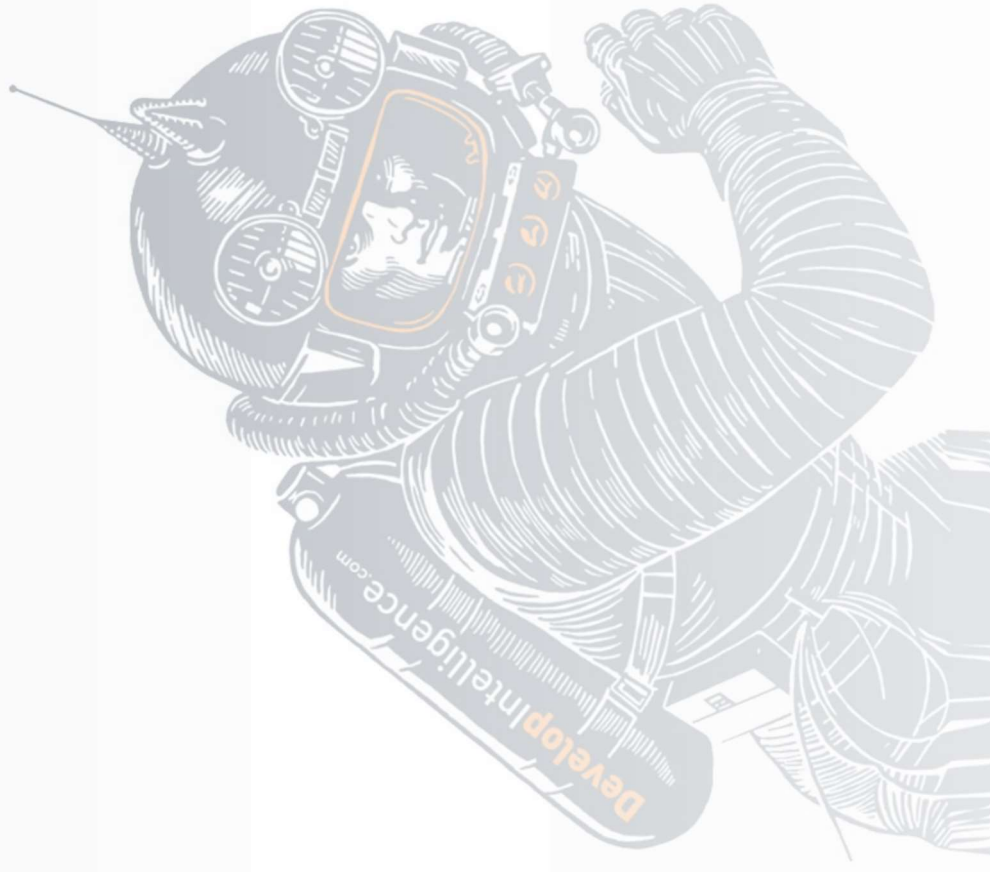




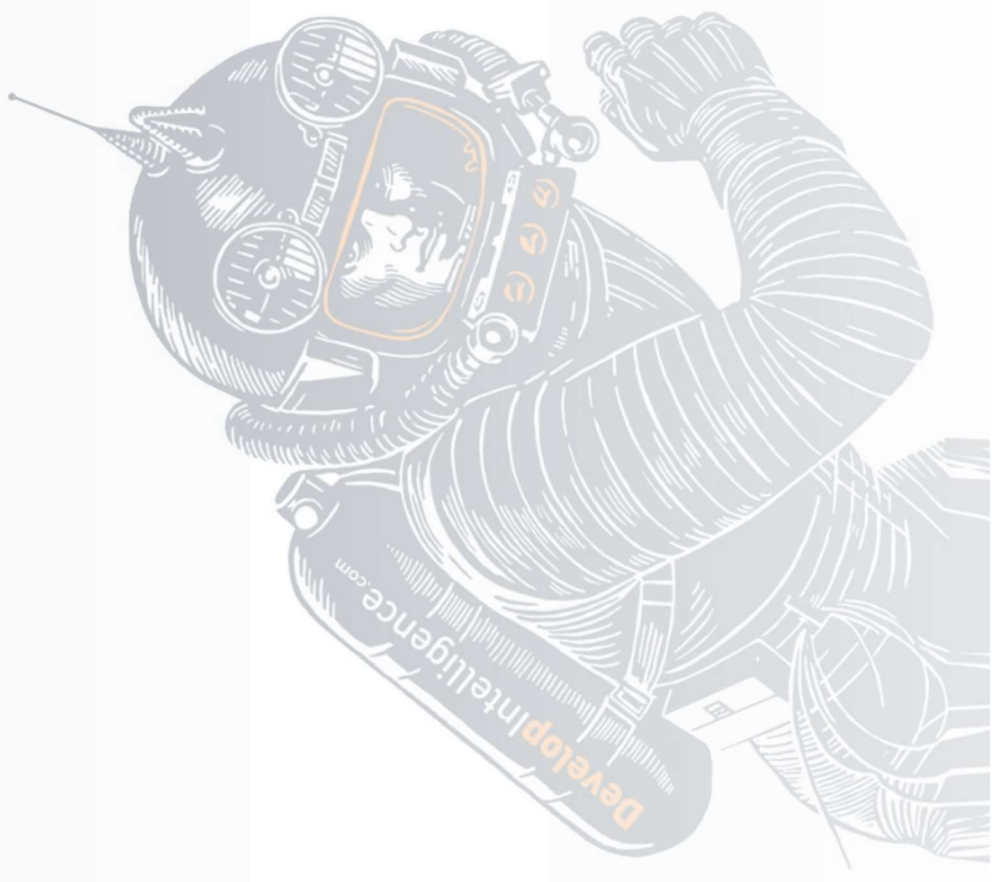
Roadmap

1. Overview
2. Introducing .NET (Core)
3. Tooling





Overview





.NET Framework: The Good Parts



AKA .NET Classic

- Multi-platform (*Sort of*)
- Managed code
- Automatic Memory Management
- Relatively performant
- Great tooling
- One-stop shop



.NET Core Revolution

AKA .NET (5+)

- Complete re-write of .NET
- Open source
- *Actually* cross-platform
- Low memory footprint



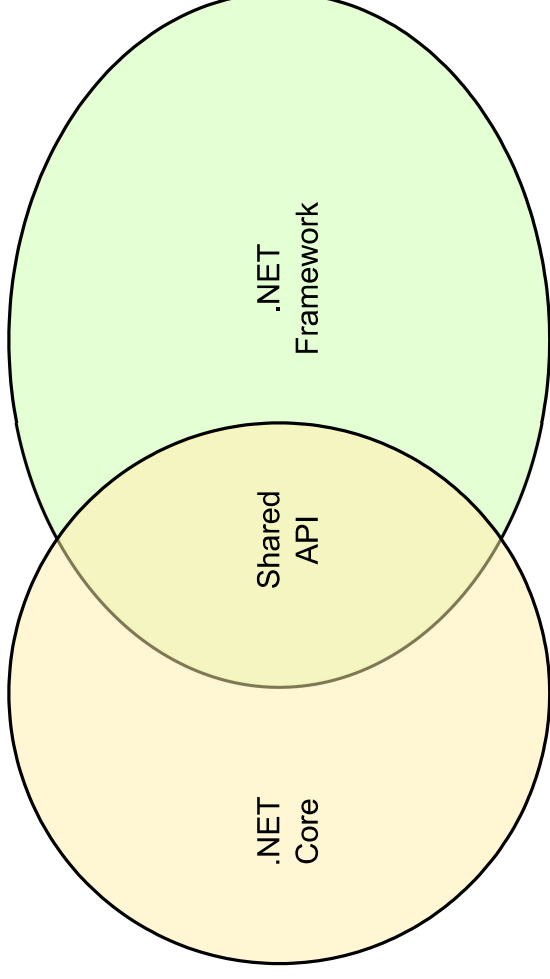
Compatibility

- Similar to .NET Framework
- But not 100% backward compatible
- Interim problem: Choosing a target platform and a version



Solution: .NET Standard

- Defines a set of APIs supported by Core and Classic
- New **New** problem: One more possible target



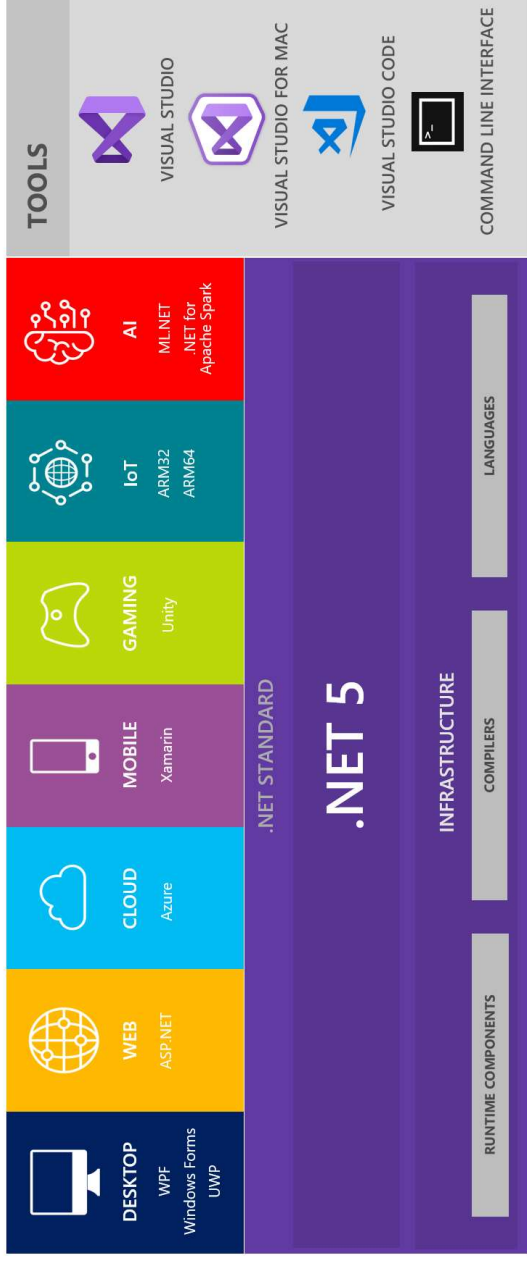


Good News Everyone!

- .NET is now unified (again)
- .NET 5 released November 2020
- New terminology
 - **Core** is now mostly implied
 - **.NET** is the current and future technology, building on the Core legacy
 - **.NET Framework** is the legacy Windows-centric technology



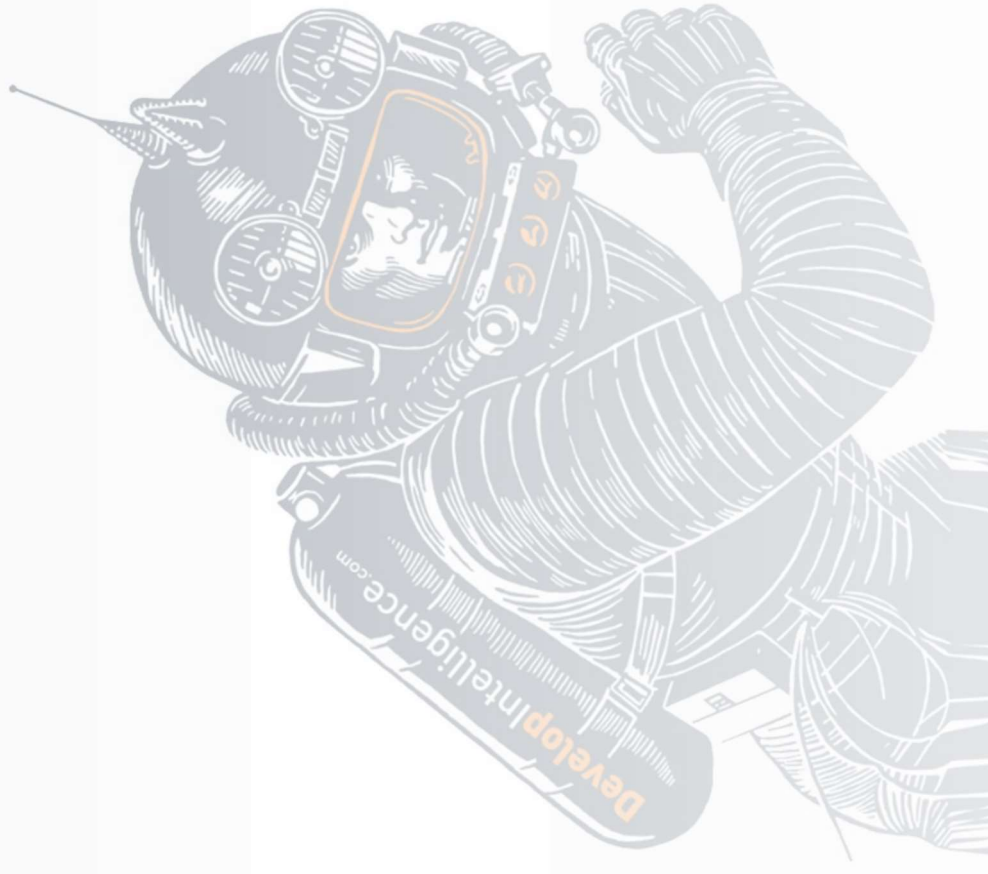
.NET- A Unified Platform



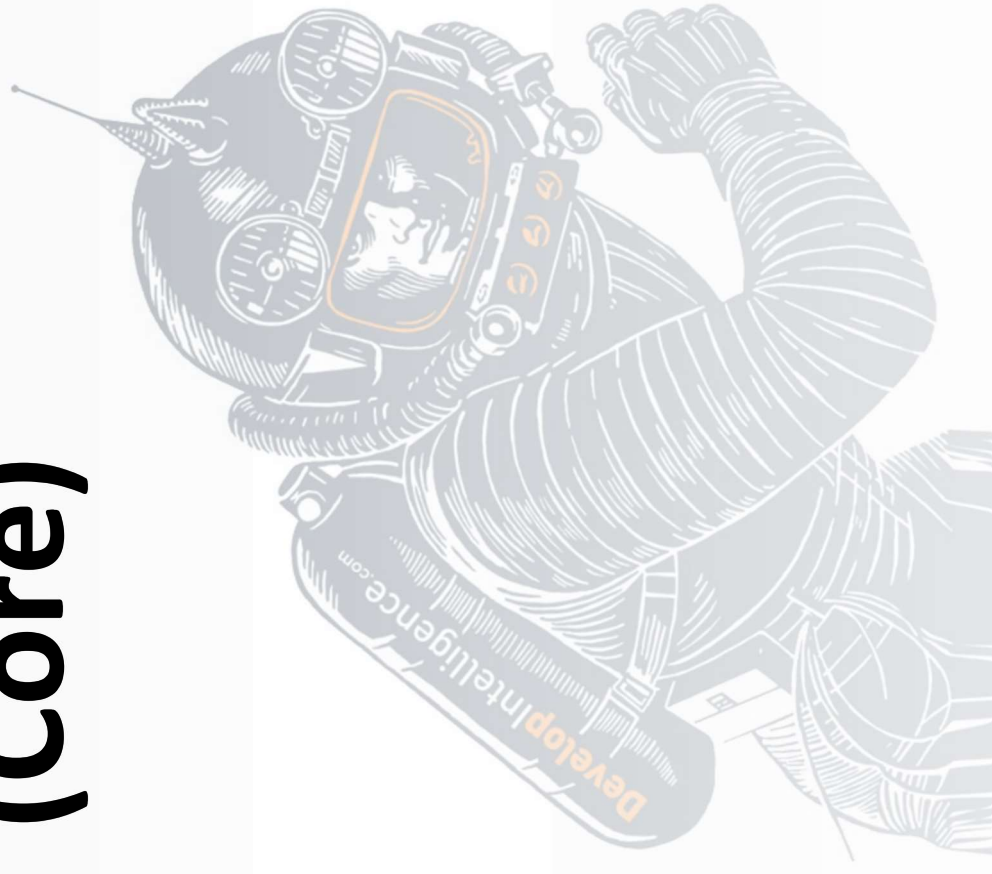


Key Technologies

- ASP.NET Core
- EF Core
- Roslyn
- Maui



Introducing .NET (Core)





Complete Re-write? Really?

Develop
Intelligence

The single worst strategic mistake that any software company can make: Rewrite the code from scratch.





Microsoft Has Come a Long Way

- Balmer days are long gone
- Windows isn't the cash cow it was
- Office sales have plateaued
- The Cloud happened





.NET Framework: Showing its Age



- Monolithic
- Slow release cycles
- Relies on legacy Windows technologies
 - ISAPI
 - COM
 - Windows Update
- Leading to
 - Performance ceilings
 - Not *really* cross-platform



Biggest Philosophical Difference



- .NET Framework is very much a **platform**
- .NET (Core) is more of an **API suite**
- Architect: David Fowler





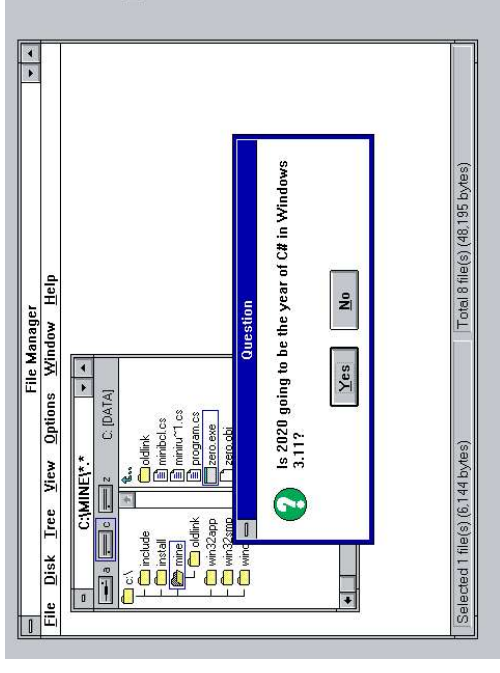
Priority: Keep it Light

- Make everything a dependency
- Focus on microservices
- Support containers
- Enable side-by-side versions
 - No GAC
- Tree-shaking



How Light?

- Arcade game in 8k Binary
- Small enough to run on Windows 3.1





.NET Has Everything (*Almost*)

- Windows Forms
- WPF
- WCF
- Universal Windows Platform
- COM Interop
- GPIO Support for Raspberry Pi



What's Missing

- Application domains
- Remoting
- Code access security (CAS)
- COM+ (System.EnterpriseServices)
- Windows Workflow Foundation (WF)



Supported Platforms

- Windows
- Linux
- OS X
- Docker
- Azure



Minimum Architecture

- CoreCLR
 - Came out of SilverLight
- CoreFX - .NET Core Base Class Library (BCL)





New Deployment Model



- **Portable applications** require a runtime
- **Self-contained applications** include *everything*.
 - No framework installation needed.





Why Choose .NET Framework



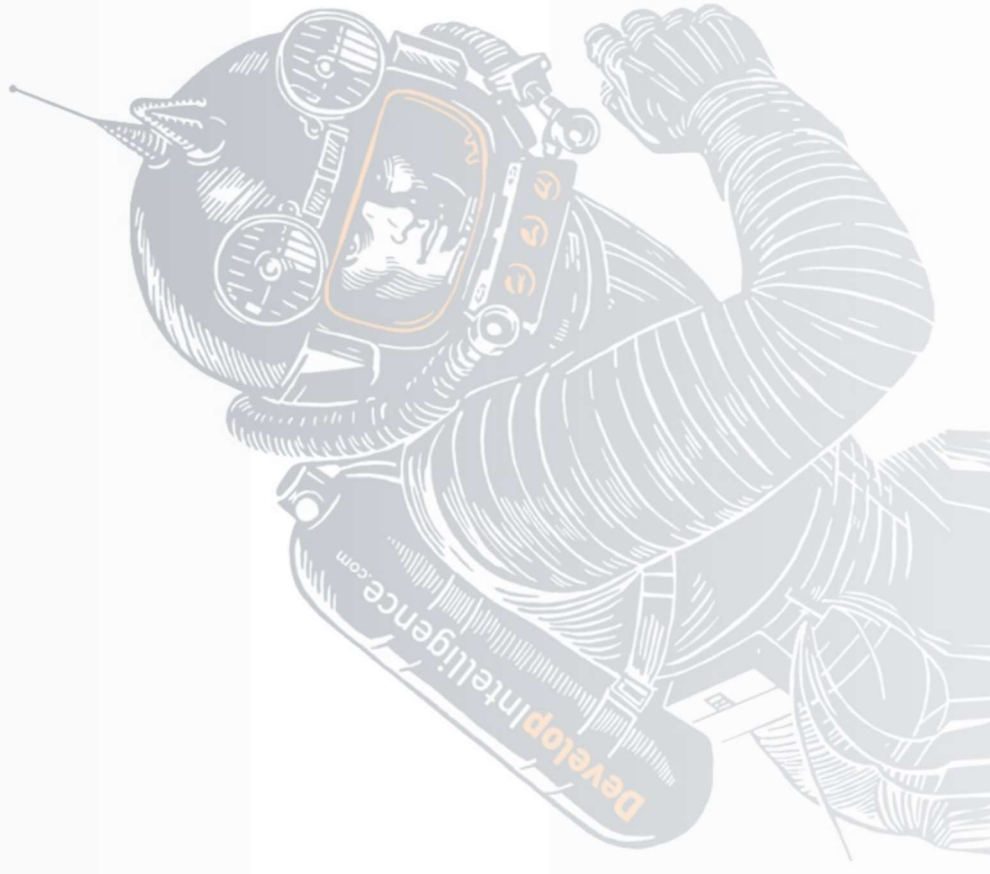
- Not many reasons
- Inertia:
 - You use third-party .NET libraries or NuGet packages not available for .NET Core
 - Porting is a hassle



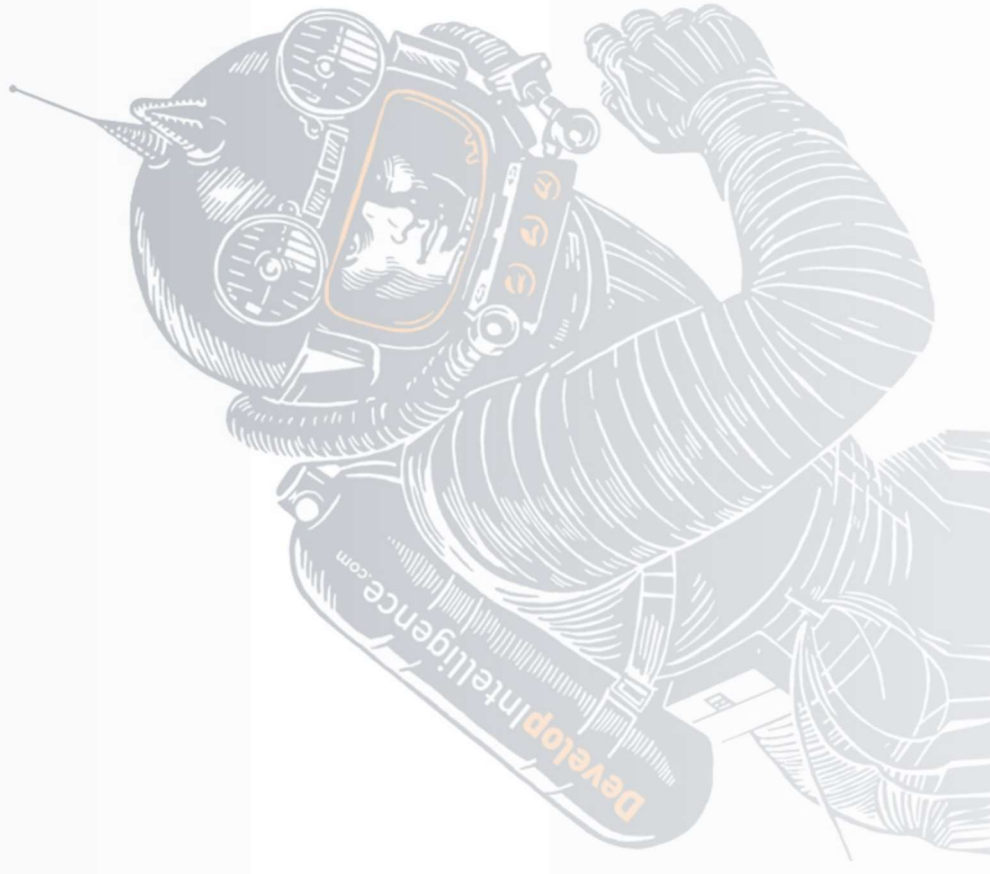


Recent History

Version / C#	Released	Features
<u>5 / 9</u>	Nov 2020	New name, JSON
<u>6 / 10</u>	Nov 2021	Performance, tooling
<u>7 / 11</u>	Nov 2022	Native AOT, better APIs
<u>8 / 12</u>	Nov 2023	TBD



Tooling





About

- In the olden days, there was 1 option
- Now there's a bunch
 - VSCode
 - Visual Studio
 - Rider
- Paradox of choice



- Similar to open source tools
 - npm
 - Angular CLI
- *But not as good*
- Good for fans of
 - vi
 - emacs
 - Linux
- *I'll try to use it as much as possible*



Core CLI Example

Command-Line Hello World

```
1 > dotnet new console -o hello
2 > cd hello
3 > dotnet run
4 Hello World!
```




VS Code



Develop
Intelligence

- Selling points
 - Open Source
 - Cross-platform
 - Lightweight
 - Extensible
- On the other hand
 - Needs configuration
 - Not quite as good



IDE Cadillac: Visual Studio



- Not going away
- Full-fledged IDE
- Still the best
- Costs money (usually)
- Not for Ubuntu (yet)





Supported Web Servers



Develop
Intelligence

- Kestrel
- IIS
- HTTP.sys
- Nginx
- Apache
- Docker



Default Web Server: Kestrel



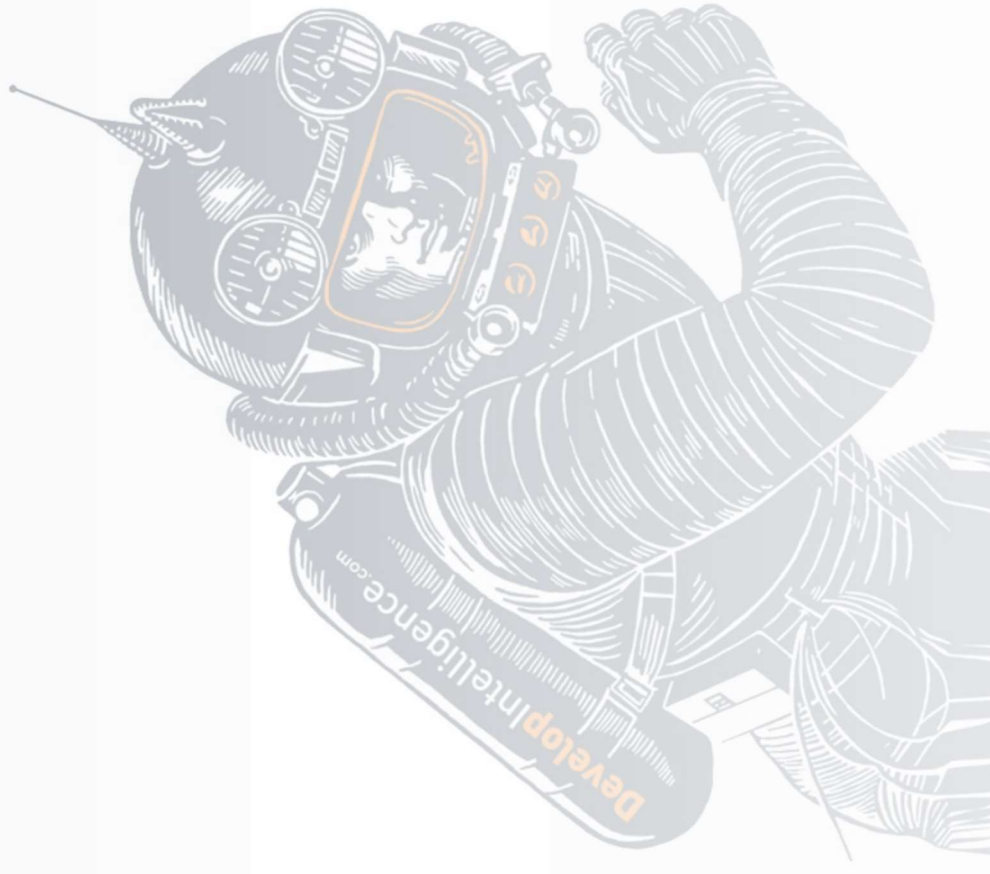
- Cross-platform
- Open-source
- Fast





Resources

- [Hanselman](#)
- [.NET Videos](#)
- [Book of the Runtime](#)
- [Github](#)
- [Sample applications](#)
- [Clean Code](#)
- [Microsoft Developer Blogs](#)
 - [Raymond Chen](#)





Review

- Name an advantage of .NET (Core)
- Distinguish between **.NET**, **.NET Core**, and **.NET Framework**

